RTCA Special Committee 186, Working Group 3

ADS-B 1090 MOPS, Revision A

Meeting #16

Proposed Revision to DO-260A for TSS Message Broadcast Rate

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SUMMARY
The current draft of DO-260A specifies that TSS message broadcast with a fixed nominal update every 1.25 seconds. DO-242A requires an increased TS Report update rate for an interval of 24 seconds following a change in certain of the report parameters. Although the draft DO-260A has included the placeholders for the future definition of an accelerated broadcast rate for TSS messages following a change in message contents, the specific requirements have not been included in the draft MOPS. This working paper proposes to revise DO-260A to specifically add this capability as a requirement.

References: 1. DO-260A, Draft 6, Dec. 2002
2. DO-242A, June 2002

1. INTRODUCTION

The current draft of DO-260A specifies that TSS message broadcast with a fixed nominal update every 1.25 seconds. DO-242A requires an increased TS Report update rate for an interval of 24 seconds following a change in certain of the report parameters. Although the draft DO-260A has included the placeholders for the future definition of an accelerated broadcast rate for TSS messages following a change in message contents, the specific requirements have not been included in the draft MOPS. This working paper proposes to revise DO-260A to specifically add this capability as a requirement.

2. PROPOSED DO-260A CHANGES

The proposed changes are needed to better align DO-160A technical capabilities with the requirements of DO-242A. It is proposed to increase the TSS message broadcast rate from 0.8 to 1.25 messages per second for a period of 24 seconds following a change in any of the parameters defined in DO-242A, section 3.4.7.2.

The specific proposed changes are DO-260A are provided in the attachment to this working paper.

ATTACHMENT -- PROPOSED DO-260A CHANGES

2.2.3.3.1.4.1 ADS-B Target State and Status Message Broadcast Rates

a. The Target State and Status Message(s) (message TYPE=29, Section 2.2.3.2.7.1) **shall** be initiated only when the aircraft is airborne and when vertical and/or horizontal trajectory intent information is available and valid as a minimum.

a. The Target State and Status Message with a SUBTYPE value of zero (0) **shall**, ~~for the nominal case~~with the exception described in item c) below, be broadcast at random intervals that are uniformly distributed over the range of 1.2 to 1.3 seconds relative to the previous Target State and System Message for as long as data is available to satisfy the requirements of subparagraph "a." above.

c. The rate at which the Target State and Status Message with a SUBTYPE value of zero (0) is broadcast **shall** be increased to random intervals that are uniformly distributed over the range of 0.75 to 0.85 seconds relative to the previous Target State and System Message for an period of 24 +/-1 seconds subsequent to any change in the value for any of the following message subfields:

- Horizontal Data Available/Source Indicator (Section 2.2.3.2.7.1.3.7)
- Target Heading/Track Angle (Section 2.2.3.2.7.1.3.8)
- Target Heading/Track Indicator (Section 2.2.3.2.7.1.3.9)
- Vertical Data Available/Source Indicator (Section 2.2.3.2.7.1.3.1)
- Target Altitude (Section 2.2.3.2.7.1.3.6)

~~c~~d. The broadcast rates for Target State and Status Messages with a SUBTYPE subfield value of other than zero (0) are not defined by this version of these MOPS.

Note 1: Future versions of these MOPS may require unique broadcast update intervals for each Target State and Status Message SUBTYPE (i.e., unique for each value of the SUBTYPE subfield).

Note 2: The requirement of item c) above also applies for the case where no Target Status and Status Message was previously being broadcast

~~*Note 2: Future versions of these MOPS may require that the broadcast rate for Target State and Status Messages be temporarily increased (e.g., for 24 seconds) following any change in intent or status information.*~~

Changes to 2.2.3.3.1.4.6.1 Event-Driven Message Scheduling Function

Modify the text under item a) ii) as follows

ii. ~~Reserved for future use.~~

~~*Note: This priority level may be used in a future version of these MOPS for the case w*~~*When an Target State and Status Message (2.2.3.2.7.1) is active for the broadcast of Target State information (message TYPE=29 and*

SUBTYPE=0) and there has been a change in one or more of the message parameters, as defined in Section 2.2.3.3.1.4.1, that results in a higher update rate reporting requirement.

2.2.3.3.2.6.1 ADS-B Aircraft Trajectory Intent and System Status Message Broadcast Rates

a. The requirements of Section 2.2.3.3.1.4.1 are applicable.

b. The Target State and System Message (TYPE=29, SUBTYPE=0, 2.2.3.2.7.1) **shall**, case with the exception described in item c) below, be broadcast at random intervals that are uniformly distributed over the range of 1.2 to 1.3 seconds relative to the previous Target State and System Status Message for as long as data is available to satisfy the requirements of subparagraph "a." above.

c. The rate at which the Target State and Status Message with a SUBTYPE value of zero (0) is broadcast **shall** be increased to random intervals that are uniformly distributed over the range of 0.75 to 0.85 seconds relative to the previous Target State and System Message for an period of 24 +/-1 seconds subsequent to any change in the value for any of the following message subfields:

- Horizontal Data Available/Source Indicator (Section 2.2.3.2.7.1.3.7)
- Target Heading/Track Angle (Section 2.2.3.2.7.1.3.8)
- Target Heading/Track Indicator (Section 2.2.3.2.7.1.3.9)
- Vertical Data Available/Source Indicator (Section 2.2.3.2.7.1.3.1)
- Target Altitude (Section 2.2.3.2.7.1.3.6)

~~c~~d. Exceptions to these transmission rate requirements **shall** be as defined in 2.2.3.3.2.9.

Revise 2.4.3.3.1.4.1 Verification of the ADS-B Target State and Status Message Broadcast Rates (2.2.3.3.1.4.1)

Under "Purpose/Introducation" incorporate the changes listed above for section 2.2.3.3.1.4.1.

Under "Measurement Procedure" make the following changes:

Step 1: ….including valid vertical target state information (as indicated in the Vertical Data Available/Source Indicator subfield - Section 2.2.3.2.7.1.3.1), valid horizontal target state information (as indicated in the Horizontal Data Available/Source Indicator Subfield - Section 2.2.3.2.7.1.3.7), and with On-Ground…….

Step 3: Change the status conditions to be valid vertical target state information uniformly distributed over the range of 0.75 to 0.85 seconds for a period of 24 +/- 1 second then decreasing to being uniformly distributed over the range of 1.2 to 1.3 seconds.

Step 4: ….. uniformly distributed over the range of 0.75 to 0.85 seconds for a period of 24 +/- 1 seconds then decreasing to being uniformly distributed over the range of 1.2 to 1.3 seconds.

Revise 2.4.3.3.2.6.1 Verification of the ADS-B Target State and Status Message Broadcast Rates (2.2.3.3.2.6.1)

Under "Purpose/Introduction" incorporate the changes listed above for section 2.2.3.3.2.6.1.

Under "Measurement Procedure" make the following changes:

Step 2: …impose invalid vertical target state information (as indicated in the Vertical Data Available/Source Indicator subfield - Section 2.2.3.2.7.1.3.1), invalid horizontal Target State information (as indicated in the Horizontal Data Available/Source Indicator Subfield - Section 2.2.3.2.7.1.3.7) …….

Step 3: ….. distributed over the range of 0.75 to 0.85 seconds for a period of 24 +/- 1 seconds then decreasing to being uniformly distributed over the range of 1.2 to 1.3 seconds.

Step 4: ….. uniformly distributed over the range of 0.75 to 0.85 seconds for a period of 24 +/- 1 seconds then decreasing to being uniformly distributed over the range of 1.2 to 1.3 seconds.